

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
ABI, Inc.	"ABI Crumbles"	100% granular sodium bentonite	Clay slurry ingredient; casing sealing material and lost circulation additive	None
ABI, Inc.	"ABI Gel"	Powdered drilling mud - type bentonite (200-mesh) with polyacrylate polymer	Rotary drilling mud bentonite and clay slurry ingredient	None
ABI, Inc.	"ABI Granular"	100% granular sodium bentonite	Clay slurry ingredient; casing sealing material for percussion drilling; and lost circulation additive	None
ABI, Inc.	"ABI Grout"	High solids bentonite grout (NSF Approved)	Bentonite grout - allowed for low capacity wells where neat cement grout is not required	Mixed according to Mfg's instructions
ABI, Inc.	"ABI Hi Yield"	Powdered drilling mud - type sodium bentonite (200-mesh) with polyacrylate polymer added	Rotary drilling mud bentonite clay; clay slurry ingredient	None
ABI, Inc.	"ABI Plug"	100% chipped sodium bentonite, slow hydrating chips	Well, drillhole and pit abandonment	None
Aqua Freed Water Retrieval Specialists	"Aqua Freed Process"	Carbon dioxide - liquid & gaseous & carbonic acid (created)	Well rehabilitation - removal of mineral encrustation and biofilm slimes	* See Warning in Footnote
AquaBiotics Industrial Pty, Ltd.	"BoreSaver IKL PRO"	A liquid chemical mixture containing hydrochloric acid, citric acid and an EO/PO co-polymer	Well rehabilitation chemical; viz. an acidic well cleaning product designed to remove carbonates, manganese and iron oxide deposits from wells	None
AquaBiotics Industrial Pty, Ltd.	"BoreSaver Ultra C"	A dry crystalline acid product containing an oxalic acid, a bisulfate, and an EO/PO co-polymer	Well rehabilitation chemical: viz. an acidic well cleaning product designed to remove iron oxide deposits from wells	None
Baroid (Halliburton) Industrial Drilling Products	"Quik-Trol Gold LV"	Natural cellulosic (PAC) polymer with a low molecular weight	Drilling fluid additive for water-based drilling fluid systems & as an additive for rotary-mud drilling fluid systems – for filtration control and drillhole stability.	None
Baroid (Halliburton) Industrial Drilling Products	"Quik-Trol Gold"	Natural cellulosic (PAC) polymer with a low molecular weight	Drilling fluid additive for water-based drilling fluid systems & as an additive for rotary-mud	None
Baroid Drilling Fluids, Inc.	"Aqua Guard Grout"	Granular bentonite (30-mesh) mixed with two proprietary inorganic ingredients to	High solids bentonite grout & annular space seal. For use where neat cement grout not required	May not be used where neat cement grout is the required seal
Baroid Drilling Fluids, Inc. (a Division of Halliburton)	"Quik Grout"	Granular Bentonite (30-mesh) mixed with two proprietary inorganic ingredients to delay swelling of granules and to reduce pH	High solids bentonite grout & annular space seal for use where neat cement grout not required	May not be used where neat cement grout is the required seal (at least 18% solids)
Baroid Industrial Drilling Products	"Aqua-Clear AE"	Liquid blend of acid & acid enhancers	Well rehabilitation; to control bacterial slime caused by iron & sulfur reducing bacteria.	* See Warning in Footnote
Baroid Industrial Drilling Products	"Aqua-Clear MSR"	Dry granular pyrophosphate blended with a dispersant	Well development & rehabilitation; to help remove drilling mud residue and sediment from well screens and other components	None
Baroid Industrial Drilling Products	"Aqua-Clear PFD"	Dry granular co-polymer viscosifying agent	Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling.	May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite.

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Baroid Industrial Drilling Products	"Baroid Granular"	Granular bentonite (30-mesh)	Clay slurry ingredient; lost circulation material for rotary - mud drilling; Seal for mounding around casing during driving	None
Baroid Industrial Drilling Products	"Barotherm"	High-solids, bentonite grout for heat-exchange drillholes	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Baroid Industrial Drilling Products	"Casing Seal"	Granular bentonite (8-14 mesh)	Clay slurry ingredient; lost circulation material for rotary - mud drilling; Seal for mounding around casing during driving	None
Baroid Industrial Drilling Products	"E-Z Mud DP"	Dry granular co-polymer viscosifying agent	Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling.	May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite.
Baroid Industrial Drilling Products	"E-Z Mud Drilling Polymer"	Co-polymer viscosifying drilling fluid agent	Additive for well drilling fluids	May not be used in highly porous limestone or dolomite formations; nor as a replacement for bentonite drilling mud.
Baroid Industrial Drilling Products	"E-Z Seal"	High solids bentonite grout material (one-sack product)	High solids bentonite grout	Allowed only for low cap. private & non-comm. wells where neat cement grout not required.
Baroid Industrial Drilling Products	"IDP-523" - Thermally Conductive Grout	High solids bentonite grout with silica sand added (One-sack grout)	Grout, sealing and heat exchange material for closed-loop heat pump drillholes.	None
Baroid Industrial Drilling Products	"IDP-550" - Thermally Conductive Grout	High solids bentonite grout with silica sand added (One-sack grout)	Grout, sealing and heat exchange material for closed-loop heat pump drillholes.	None
Baroid Industrial Drilling Products	"Mud-Gel"	Powdered drilling mud - type sodium bentonite (200-mesh) with 0.0125% polyacrylate polymer added	Rotary drilling mud clay; clay slurry ingredient	None
Baroid Industrial Drilling Products	"N-Seal"	Extrusion spun mineral fiber	Lost circulation material	None
Baroid Industrial Drilling Products	"Penetrol"	Non-ionic wetting agent	Drill fluid additive where air or air/foam drilling methods are used	None
Baroid Industrial Drilling Products	"Poly-Bore"	100% dry granular polymer (PHPA)	Water based drilling fluid additive for reverse-rotary (and horizontal directional drilling) methods – Designed to improve viscosity characteristics of drilling fluid & to help stabilize drillhole	None
Baroid Industrial Drilling Products	"Quik-Trol LV"	Natural cellulosic polymer with a low molecular weight	Drilling fluid additive for water-based drilling fluid systems & as an additive for rotary-mud drilling fluid systems	None
Baroid Industrial Drilling Products	"Quik-Trol"	Natural cellulosic polymer	Drilling fluid additive for water-based drilling fluids; And as an additive to be used for rotary-mud drilling fluid systems & for rotary air-foam drilling systems – to 'stiffen' the foam	None
Baroid Industrial Drilling Products	"Aqua-Clear MGA"	Dry blend of granular acid with additives	Well rehabilitation; to remove iron, manganese and carbonate scale	* See Warning in Footnote
Baroid Industrial Drilling Products (a Division of Halliburton)	"Quik Gel Gold"	Premium grade drilling mud - type sodium bentonite (200-mesh)	Rotary drilling mud clay; clay slurry ingredient	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Bentonite Corp.	"Opti Seal"	100% chipped sodium bentonite; 3/8" & 3/4" slow hydrating chips	Well, drillhole and pit abandonment	None
Black Hills Bentonite Co.	"Tower Plug"	100% chipped bentonite - slow hydrating chips (both 3/8" & 3/4" chips)	Well, drillhole & pit abandonment	None
Black Hills Bentonite LLC	"Black Hills Bentonite Plug"	100 % Bentonite chips	Well, Drillhole & Pit Abandonment	None
Brenntag Great Lakes, LLC (Auer Steel, Distributor)	"Ethanol SDA-3C 200 Proof"	Ethanol alcohol antifreeze fluid with isopropyl alcohol as denaturing additive	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Calciquest	"Bio Sabre"	Sodium-based blend of phosphate ingredients	Well rehabilitation, especially to penetrate and break down biofilms in wells.	None
Carus Chemical Company	"IntelliChlor"	Liquid blend of acid with an additive enhancer	Controlling pH during chlorination disinfection procedures & for well rehab.	* See Warning in Footnote
CETCO	"CETCO Crumbles" (Formerly "Crumbles" & "Volclay Crumbles")	100% ground (8-20 mesh) granular sodium bentonite (No additives) (NSF Approved)	Clay slurry ingredient; seal for driving casing and last circulation material for rotary mud drilling	None
CETCO	"Crumbles" (Volclay) (See "CETCO Crumbles")	100% ground (8-20 mesh) granular sodium bentonite (No additives) (NSF Approved)	Clay slurry ingredient; seal for driving casing and last circulation material for rotary mud drilling	None
CETCO	"Custom Seal Granular" (C/S Granular-Volclay)	100% ground (40-50 mesh) sodium bentonite (granular)	Clay slurry ingredient & lost circulation material for rotary-mud drilling; Seal for driving casing	None
CETCO	"DPA"	Concentrated, white granular nonvolatile inorganic acid (NSF Approved)	Well treatment for cleaning mineral scale from screens, gravel packs and formation material	* See Warning in Footnote
CETCO	"LBA" (Liquid Chelatin Agent) (Formerly Liquid Biofouling Agent)	Liquid organic acid chelating agent (NSF Approved)	Well treatment for iron bacteria by removing slime and destroying bacteria	* See Warning in Footnote
CETCO	"Premium Gel"	Powdered drilling mud-type sodium bentonite (200-mesh) with ½ -1 lb./ton of sodium polyacrylate polymer added; 90 bbl yield; API Drilling Fluid (NSF Approved)	Rotary drilling mud & clay slurry ingredient	None
CETCO	"Pure Gold Gel"	Untreated powdered (200-mesh) drilling mud-type bentonite - additive free; 90 bbl yield - organic free (NSF Approved)	Rotary drilling mud clay; clay slurry ingredient esp. for environmental drilling	None
CETCO	"Pure Gold Grout"	Organic-free western sodium bentonite and proprietary mixture of sulfate (NSF Approved)	High solids bentonite grout for use where neat cement grout not required	None
CETCO	"SC-200"	Non-ionic liquid surfactant wetting agent	Well rehabilitation; enhances dispersing efficiency of other well rehab products and for well development	None
CETCO	"Shore Pac"	Dry polymer viscosifying agent	Drilling fluid additive for both rotary mud and rotary air/foam drilling operations	May only be used as an additive and not as a complete replacement for rotary drilling mud

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
CETCO	"Super Gel-X"	High viscosity (200 bbl yield) powdered drilling mud - type sodium bentonite (200-mesh) with ½ - 1 lb./ton of sodium polyacrylate polymer added (NSF Approved)	Rotary drilling mud & clay slurry ingredient	(See approval)
CETCO	"Versafoam"	Anionic Surfactant composed of alkyl ether sulfate (ammonium salt)	For rotary drilling to help remove drill cuttings; but only in bedrock	None
CETCO	"Volclay Chips" (See CETCO Chips")	100% chipped sodium bentonite - slow hydrating chips (medium – 1/4-3/8") (coarse – 3/8-3/4")	Well, drillhole & pit abandonment	None
CETCO	"Volclay Crumbles" (See "CETCO Crumbles")	100% ground (8-20 mesh) granular sodium bentonite	Clay slurry ingredient & lost circulation material for rotary mud drilling	None
CETCO	"Volclay Grout" (See CETCO Grout") (Bentonite Grout)	Low yield bentonite single component bentonite grout - no additives (NSF Approved)	High solids bentonite grout for use where neat cement grout is not required	Allowed only where neat cement grout is not required - must be mixed according to instructions with product
CETCO	"BMR" (Bentonite Mud Remover)	Inorganic acid salt (NSF Approved)	Well Development - by breaking down bentonite mud & natural clays and by dispersing and suspending clay particles	None
CETCO	"CETCO Chips" (Formerly "Volclay Chips")	100% chipped sodium bentonite - slow hydrating chips (medium – 1/4-3/8") (coarse – 3/8-3/4")	Well, drillhole & pit abandonment	None
CETCO	"CETCO Granular Grout"	Granular Bentonite with additives (NSF Approved)	Clay slurry ingredient; seal for driving casing and sealing material for geothermal drillholes.	None
CETCO	"Clay Cutter Dry"	Dry Polymer borehole stabilizer	Drilling mud additive to increase cuttings returns and reduce torque and drag when drilling reactive clay soils.	Mixed according to Mfg.'s instruction
CETCO	"Insta-Vis Dry"	Dry polymer viscosifying agent	Drilling fluid additive for both rotary mud and rotary air/foam drilling operations	May only be used as an additive and not as a complete replacement for rotary drilling mud
CETCO	"Pure Gold Chips"	Sodium bentonite chips (Coarse 3/8-3/4" and medium 1/4-3/8")	Well, drillhole & pit abandonment.	None
CETCO	CETCO Grout" (Formerly "Volclay Grout") (Bentonite Grout)	Low yield bentonite single component bentonite grout - no additives (NSF Approved)	High solids bentonite grout for use where neat cement grout is not required	Allowed only where neat cement grout is not required - must be mixed according to instructions with product
CETCO	Insta-Vis Plus	Liquid polymer viscosifying agent	Drilling fluid additive for both rotary mud and rotary air/foam drilling operations	May only be used as an additive and not as a complete replacement for rotary drilling mud
CETCO Drilling Products	"Geothermal Grout"	High-solids bentonite grout for heat-exchange drillholes	Grout, sealing and heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
CETCO Drilling Products	"High TC Geothermal Grout"	High-solids bentonite grout for heat-exchange drillholes	Grout, sealing and heat exchange material for closed-loop heat pump drillholes.	None
CETCO; formerly Clear Well Sales, Inc.	"Clear Well Bacteria Controller" (BC&BE)	Weak acid plus a proprietary surfactant additive	Acidation product for wells to remove organic screen encrustation	* See Warning in Footnote
CETCO; formerly Clear Well Sales, Inc.	"Clear Well Granular Acid" ("GA")	Weak acid plus a proprietary inhibitor & surfactant	Acidation product for wells to remove inorganic screen encrustation	* See Warning in Footnote

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
CETCO; formerly Clear Well Sales, Inc.	"Clear Well Sediment and Mud Remover" (SR)	Phosphates	Dispersant for removing drilling mud, sediments and clays from wells during development	None
Cotey Chemical Corp.	"Dry Acid Special"	Chemical powder that produces sulfamic acid when mixed with water	Well development and rehabilitation	* See Warning in Footnote
Cotey Chemical Corp.	"Dry Acid"	Chemical powder that produces sulfuric acid when mixed with water	Well development and rehabilitation	* See Warning in Footnote
Cotey Chemical Corp.	"Liquid Acid Descaler"	A mixture of liquid acids (Hydrochloric and glycolic) and a surfactant	Well development and rehabilitation	* See Warning in Footnote
Cotey Chemical Corp.	"Mud-Nox"	Nonionic Surfactant	Well development and rehabilitation	None
Cotey Chemical Corp.	"Welgicide Cleaner"	Chemical Powder - containing a silicate, hydroxide and a pyrophosphate	Well rehabilitation	None
Covalent Laboratores	"ColdFLOW - PEG"	Propylene Glycol with inhibitors.	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Cowboy Mining Co.	"Cowboy Brand Granular Seal"	100% Granular Bentonite (8-mesh)	Clay slurry ingredient; casing sealing material for percussion drilling & lost circulation additive	None
Cowboy Mining Co.	"Cowboy Brand Bentonite Chips" (Fine, Medium & Coarse)	100% Bentonite Chips	Well, Drillhole & Pit Abandonment	None
Cowboy Mining Co.	"Cowboy Brand Grout"	High Solids Bentonite Grout (100% Bentonite) (NSF-Approved)	High Solids Bentonite Grout – Allowed for low capacity wells when neat cement grout not required	Mixed according to Mfg.'s instruction
Desert Drilling Fluids, Inc.	"Amfoam"	Anionic Surfactant	Foam for rotary drilling to help remove drill cuttings, but only for bedrock	(See approval)
Desert Drilling Fluids, Inc.	"DDF Foamer"	Anionic Surfactant	Foam for rotary drilling to help remove cuttings, but only for bedrock	None
Design Water Technologies	"ChloralPal"	Buffered acid	To control pH during well chlorination procedures	* See Warning in Footnote
Distributed by Economy Mud Products Co.	"Econoplug Grout"	High solids (30%) sodium bentonite grout material	High solids bentonite (clay) grout for use where neat cement grout is not required	Mud weight of 9.9 lbs/gal. - check for settling
Distributed by Economy Mud Products Co.	"Econoplug"	100% chipped sodium bentonite - slow hydrating chips; medium (1/4 - 3/8 ") & coarse (3/8 - 3/4")	Well, drillhole & pit abandonment	See instruction sheet
Distributed by Economy Mud Products Co.	"Poly- Gel"	Powdered, drilling mud -type bentonite (200-mesh) with ½ lb./ton proprietary polymer added (NSF Approved)	Rotary drilling mud clay; clay slurry ingredient	None
Distributed by Industrial Solutions, Inc	"Eco-Smart HTF"	Propylene glycol based antifreeze fluid with corrosion inhibitor	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Distributed by International Drilling Fluids, Inc.	"Kwik-Ben"	Powdered, drilling mud-type bentonite (200-mesh) with ½ lb./ton proprietary polymer added (NSF Approved)	Rotary drilling mud clay; clay slurry ingredient	None
Dow Chemical Company	"DOWFROST"	Propylene glycol based antifreeze fluid with corrosion inhibitor	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Drilling Specialists Company	"Drispac"	Polyanionic cellulose	Drilling fluid additive to be added to clear water for drillhole stability	None
Ecolab, Inc.	"XY-12"	Primarily sodium hypochlorite	Well disinfection and treatment	None
Federal Summit	"Gel Supreme"	Untreated powdered (200-mesh) drilling mud bentonite (no additives)	Drilling mud, clay slurry ingredient	None
Federal Summit	"Kwik-Plug Coarse & Medium"	100% chipped sodium bentonite. coarse (3/4") medium (3/8")	Well, drillhole and pit abandonment	None
Federal Summit	"Kwik-Plug Fine"	Granular bentonite (8-mesh)	High Solids bentonite grout; Annular space seal for driving casing	None
Federal Summit	"Kwik-Plug Micro"	Granular bentonite (16-20 mesh)	High Solids bentonite grout; Annular space seal for driving casing	None
Federal Summit	"Max-Gel"	Powdered (200-mesh) drilling mud bentonite with proprietary additive @ 0.10-0.15%	Drilling mud; clay slurry ingredient	None
Federal Summit	"Hi-Yield Gel"	Powdered (200-mesh) drilling mud bentonite with proprietary additive @ 0.10-0.15%	Drilling mud; clay slurry ingredient	None
Federal Summit (Formerly M-1 Drilling Fluids)	"Kwik-Thik"	Powdered (200-mesh) bentonite for rotary drilling mud with proprietary ingredient at 0.10-0.15%	Drilling mud bentonite and clay slurry ingredient	None
Fluidril Mud Systems (from Black Hills Bentonite)	"Well-Plug"	100% chipped bentonite - slow hydrating chips (both 3/8" & 3/4" chips)	Well, drillhole & pit abandonment	None
Fremont Industries Water Management Solutions	"Fremont 9134FG; 9134FG-25D; 9134FG-30D; 9134FG-35D; 9134FG-40D; 9134FG-45D & 9134FG-50D"	Propylene glycol-based antifreeze fluid with corrosion inhibitor	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Fremont Industries/CDG Environmental/Anderson Chemical	"CDG Solution 3000"	0.3% Chlorine Dioxide Aqueous Solution	Biocide for well rehabilitation and closed loop heat pump applications	* See Warning in Footnote
Geo Pro, Inc. & Black Hills Bentonite, L.L.C.	"BH ²⁰ Grout"	High solids (20%) bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Geo Pro, Inc. & Black Hills Bentonite, L.L.C.	"BH Ultra"	High solids (20%) bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Geo Pro, Inc. & Black Hills Bentonite, L.L.C.	"Thermal Grout Lite"	High solids (20%) bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Geo Pro, Inc. & Black Hills Bentonite, L.L.C.	"Thermal Grout Select"	High solids (20%) bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
GeoPro, Inc.	"12/40 Granular"	Granular bentonite (100%)	Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
GeoPro, Inc.	"8/25 Granular"	Granular bentonite (100%)	Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving	None
GeoPro, Inc.	"Bentonite Plug" ("3/8-inch & 3/4-inch)	Bentonite chips (100%)	Well, drillhole & pit abandonment	None
GeoPro, Inc.	"Black Hills Gel"	Powdered, drilling mud-type bentonite (lower yield) (200-mesh), with polymer	Rotary drilling mud bentonite clay; clay slurry ingredient	None
GeoPro, Inc.	"HYG 200 GEL"	Powdered, drilling mud-type bentonite (high yield) (200-mesh), with polymer	Rotary drilling mud clay; clay slurry ingredient	None
GeoPro, Inc.	"PowerTEC"	Graphite-based product	Additive for approved high solids bentonite grout, but only for closed-loop geothermal drillholes.	To be used only for geothermal drillholes, according to Mfg.'s instructions.
Halliburton (Baroid) Industrial Drilling Products	"AQF-2"	Anionic Surfactant	Foam for rotary drilling to help remove cuttings, but only for bedrock	None
Halliburton (Baroid) Industrial Drilling Products	"Barotherm Gold"	High-solids thermally conductive bentonite grout for heat-exchange drillholes	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Halliburton (Baroid) Industrial Drilling Products	"Barotherm Max"	High-solids thermally conductive bentonite grout for heat-exchange drillholes. Contains carbonaceous additives, mainly graphite.	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	May only be used for closed-loop geothermal drillholes
Halliburton (Baroid) Industrial Drilling Products	"Barotherm Plus"	High-solids thermally conductive bentonite grout for heat-exchange drillholes.	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None – May also be used for water well construction.
Halliburton (Baroid) Industrial Drilling Products	"Bore-Grout"	High-solids thermally conductive bentonite grout for heat-exchange drillholes that are not vertical (plumb).	Grout, sealing or heat exchange material for closed-loop heat pump geothermal drillholes.	May only be used for closed-loop geothermal drillholes that are not vertical.
Halliburton (Baroid) Industrial Drilling Products	"EZ Mud Gold"	Dry anionic polymer (beads) - viscosifying agent	Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling.	May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite.
Halliburton (Baroid) Industrial Drilling Products	"Quik Mud Gold"	Liquid copolymer – Partially hydrolyzed polyacrylamide-polyacrylate (PHPA) viscosifying agent	Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling.	May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite.
Halliburton (Baroid) Industrial Drilling Products	"Quik Mud Gold"	Dry anionic polymer - viscosifying agent	Drilling fluid product to be added to mix water to improve drillhole stability for rotary mud-circulation drilling and to improve carrying capacity for air or air/foam drilling.	May only be used as an additive and not as a complete replacement for rotary drilling mud; Also, may not be used in highly porous limestone or dolomite.
Heartland Solutions, Inc	"Oil Safe AR	Synthetic Acid Replacement	Well rehabilitation, to dissolve encrustation on well screens and surrounding formation.	* See Warning in Footnote
Hercules Chemical Company	"Cryo-tek/AL"	Propylene glycol-based antifreeze fluid with a sodium salt solution corrosion inhibitor and an organic acid additive for pH control	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
H-O-H Water Technology, Inc.	"PRO-KOOL 75M"	Propylene glycol based antifreeze fluid with a corrosion inhibitor, a buffering agent and a pH adjuster.	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Houghton Chemical Corporation	"Safe-T-Therm"	Propylene glycol based antifreeze fluid	Heat transfer fluid for closed-loop geothermal drillhole heat exchange systems	None
Houghton Chemical Corporation	"GeoSafe 25"	Ethanol alcohol (ethyl alcohol) antifreeze fluid with denaturants and a phosphate additive for corrosion control (A diluted form of "GeoSafe")	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Houghton Chemical Corporation	"GeoSafe"	Ethanol alcohol (ethyl alcohol) antifreeze fluid with denaturants and a phosphate additive for corrosion control.	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Hydrite Chemical Company	"Muriatic Acid 20 degree 103L"	Muriatic acid with an inhibitor	Well rehabilitation and controlling pH during well chlorination.	* See Warning in Footnote
International Drilling Fluids, Inc.	"Interfoam"	Anionic surfactant	Foam for rotary drilling to help remove cuttings, but only in bedrock	None
Interstate Chemical Co. Inc.	"Intercool P-323"	Propylene glycol based antifreeze fluid with corrosion inhibitor	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Interstate Chemical Company	"PROCOOL"	Ethanol alcohol (ethyl alcohol) antifreeze fluid with a phosphate additive for corrosion control.	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Jacam Chemical Partners, Ltd.	"Redi - Clean 1"	Weak acid & proprietary additives including a salt and a non-hazardous surfactant	Acidation product for wells esp. for screen encrustation	* See Warning in Footnote
Johnson Division, UOP, Inc. (now U.S. Filter/Johnson Screen)	"Nu - Well"	Pelletized sulfamic acid with inhibition wetting agent and other ingredients (information confid. held by Department)	Dissolve encrustation on well screens and surrounding formation	* See Warning in Footnote
Layne Christensen Company	"Layne Oximate"	Liquid acidic/surfactant product	Help control pH of disinfection/rehabilitation solution	None
Layne-Northwest, subsidiary of Layne, Inc.	"QC-21"	Aqueous solution of organic acid, with chelating agents and a surfactant.	Cleaning & well rehabilitation agent to control mineral precipitants, metal oxides and organic bio-mass deposits in well screens & gravel packs.	* See Warning in Footnote
Loresco International, Inc.	"Loresco Type SC.3"	A base carbon material with a proprietary ingredient for reducing surface tension for compact settling under water.	Conductive backfill material to surround anodes in a cathodic protection drillhole.	NR 812 requires prior department approval for a cathodic protection drillhole.
Loresco. Distributed by Cathodic Engineering Equip. Co., Inc.	"Permaplug"	100% chipped sodium bentonite - slow hydrating chips; medium (1/4 - 3/8") & coarse (1/2 - 3/4")	Well, drillhole & pit abandonment	None
Loresco; Distributed by Cathodic Engineering Equip. Co., Inc.	"EnviroCoke IV"	Conductive Carbon Grout; High temperature calcined petroleum coke	Grout for deep anode drillholes used for cathodic protection.	NR 812 requires prior department approval for a cathodic protection drillhole.

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
M-1 Drilling Fluids (Federal)	"Federal 200"; a.k.a. "Federal High Yield"	Powdered (200-mesh) drilling mud-type bentonite with proprietary ingredient additive @ 0.10-0.15%	Drilling mud bentonite; clay slurry ingredient	None
M-1 Drilling Fluids (Federal)	"Federal Granular"	100% Granular sodium Bentonite (~48-150 mesh)	Clay slurry ingredient - sealant for driving casing; lost circulation material	None
M-1 Drilling Fluids (Federal)	"Federal Plug"	100% of chipped sodium bentonite - slow hydrating; medium (1/4" – 3/8") and coarse (3/8 – 3/4inch)	Well, drillhole and pit abandonment	See instruction sheet
M-1 Drilling Fluids (Federal)	"Federal-BP-8"	100% Granular sodium Bentonite (8-20 mesh)	Clay slurry ingredient - sealant for driving casing; lost circulation material	None
M-I SWACO HDD Mining and Water Well Group	"Gopher Grout"	High solids bentonite grout (NSF Certified)	Bentonite grout. Allowed for low capacity wells where neat cement grout is not required.	Mud weight at least 9.4 lbs/gal.
M-I SWACO HDD Mining and Water Well Group	"Smooth Grout 20"	High solids bentonite grout (NSF Certified)	Bentonite grout. Allowed for low capacity wells where neat cement grout is not required.	Mud weight at least 9.4 lbs/gal.
M-I SWACO HDD Mining and Water Well Group	"Smooth Grout 30"	High solids bentonite grout (NSF Certified)	Bentonite grout. Allowed for low capacity wells where neat cement grout is not required.	Mud weight at least 10.0 lbs/gal.
N. L. Baroid	"Aqualgel Gold Seal"	Untreated 100% drilling mud sodium bentonite (powder)(200-mesh)	Rotary drilling mud clay; clay slurry ingredient	None
N. L. Baroid	"Aqualgel"	Powdered drilling mud-type sodium bentonite (200-mesh) with 0.0125% polyacrylate polymer added	Rotary drilling mud clay; Clay slurry ingredient	(See approval)
N. L. Baroid	"Benseal"	100% coarsely-ground (8-mesh) sodium bentonite	Clay slurry ingredient; lost circulation material for rotary-mud drilling; Seal for mounding around casing during driving	None
N. L. Baroid	"Drilfoam"	Anionic surfactant composed of alkyl ether sulfate (ammonium salt)	For rotary drilling to help remove drill cuttings, but only in bedrock	See approval
N. L. Baroid	"Holeplug"	100% chipped sodium bentonite; 3/8" and 3/4" slow hydrating chips	Well, drillhole and pit abandonment	See instruction sheet
N. L. Baroid	"Micatex"	Muscovite mica (fluorhlogopite) flakes (powder to small gain consistency)	Restore circulation of rotary drilling fluid after last circulation occurs	To be used only as a last resort to restore circulation
N. L. Baroid	"Quik Foam"	Anionic surfactant composed of alkyl ether sulfate (ammonium salt)	For rotary drilling to help remove drill cutting, but only in bedrock	None
N. L. Baroid	"Quik Gel"	Premium grade drilling mud-type sodium bentonite (200-mesh) with 0.11% sodium,	Rotary drilling mud clay; clay slurry ingredient	None
N. L. Baroid	"Zeogel"	Ground attapulgit clay - magnesium aluminum silicate ("Fuller's Earth") (a.k.a. sweeping compound)	Rotary drilling mud clay for drilling information with high salt content	None
N.L. Baroid	"AquaGrout Catalyst: a.k.a. "Benseal-AquaGrout Catalyst"	Granular bentonite mixed with a catalyst composed of four inorganic ingredients	High solids bentonite grout. For use where neat cement grout is not required	Allowed only for low cap. private & non-comm. wells where neat cement grout not required.

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013

Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Noble Company	"NOBURST HD	Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Noble Company	"NOBURST HD 100"	Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor and defoaming agent	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Noble Company	"NOBURST HD 50%"	Monopropylene (Propylene glycol) - based antifreeze fluid with corrosion inhibitor and defoaming agent	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
NU-Calgon	"Freez-kontr'l"	Propylene glycol-based antifreeze fluid with corrosion inhibitor	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Pharmco-aaper	"Exoendosol 101"	Ethanol alcohol antifreeze fluid with denaturing and lubricant additives	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Polymer Drilling System (PdsCo)	"PdsCo Granular"	100% ground (8 - 20 mesh) granular sodium bentonite	Clay slurry ingredient & lost circulation material for rotary mud drilling	None
Polymer Drilling systems (PdsCo)	"PdsCo Grout"	High Solids Bentonite Grout (NSF Approved)	High solids bentonite grout - allowed for low capacity wells where neat cement grout not required	Mixed according to Mfg's instructions
Polymer Drilling Systems (PdsCo)	"PdsCo High Yield"	Powdered drilling mud - type sodium bentonite (200-mesh) with 2 - 3 lbs/ton of sodium polyacrylate polymer added	Rotary drilling mud & clay slurry ingredient	(See approval)
Polymer Drilling Systems (PdsCo)	"PdsCo Plug"	100% chipped sodium bentonite slow hydrating chips (coarse - 3/4") (medium - 3/8")	Well, drillhole & pit abandonment	None
Pristine Water Solutions	"BioPurge WD-3100	Biodispersant and biopenetrant	Control biofilms and reduce other biologically related problems in wells	None
Rhomar Water Management, Inc.	"EnviroGard"	Non-toxic propylene glycol based antifreeze fluid.	Heat transfer fluid for ground-coupled, closed-loop geothermal heat exchange systems	None
Rhomar Water Management, Inc.	"RhoGard Ultra DP"	Non-toxic propylene glycol based antifreeze fluid.	Heat transfer fluid for ground-coupled, closed-loop geothermal heat exchange systems	None
Rin Rockford (Stiles-Kem Division)	"Bio Purge BD-2000"	Biodispersant and biopenetrant	Control biofilms and reduce other biologically related problems in wells	None
Several brands	"Detergent; liquid dishwashing - food grade"	Liquid surfactant	Cleaning wells contaminated with PCB oils from submersible pumps and capacitors	Food grade; no additives - like color or scent additives
Shamrock Chicago Corp	"Rockfrost HD"	Propylene glycol based antifreeze fluid with corrosion inhibitor and coloring dye	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Shamrock Chicago Corp	"Shamrock Lo Tox Antifreeze"	Propylene glycol based antifreeze fluid with corrosion inhibitor and coloring dye	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Shamrock Chicago Corp	Champion RV Antifreeze Minus 100	Propylene glycol based antifreeze fluid with corrosion inhibitor and coloring dye	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
SuperGrout Products, LLC	"Geo SuperGrout"	Cementitious grout containing Portland Cement and other cement derivatives	Grouting material for closed-loop, heat exchange drillholes.	None
The Kjell Corporation	"F-25 Well Conditioner"	Liquid polymerized anionic phosphate complex	Well rehabilitation - cleaning wells contaminated with biofilms	None
U.S. Filter/Johnson Screen	"NW-310"	Polymeric acid (To be used in combination with "Nu-Well")	Well rehabilitation. To help break biofilms, disperse mineral salts, maintain acid reaction and hold debris in suspension.	* See Warning in Footnote
UTILITY Manufacturing Company	"No-Freez"	Propylene Glycol with inhibitors and dye.	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
UTILITY Manufacturing Company	"Polar Grade No-Freez"	Propylene Glycol with inhibitors and dye.	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
UTILITY Manufacturing Company	"Super Polar Grade No-Freez Concentrate"	Propylene Glycol with inhibitors and dye.	Heat exchange fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Water Systems Engineering, Inc.	"NW-220"	Polymeric dispersant	Well development and redevelopment – To remove clays, muds and sediment from a well	None
Water Well Solutions	"WS ² 3602 -- Well Conditioner"	Sodium-based blend of phosphate ingredients	Well rehabilitation, especially to penetrate and break down biofilms in wells.	None
WaterFurnace International	"Environol"	Non-toxic ethanol (grain) alcohol-based antifreeze fluid with additives for lubrication, denaturing and coloring.	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Wausau Chemical Corporation	"Heat Transfer HTF-PG-HD" Fluid	Propylene glycol-based antifreeze fluid with two corrosion inhibitors	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Wausau Chemical Corporation	"Heat Transfer PG-ND" Fluid	Propylene glycol-based antifreeze fluid with corrosion inhibitor	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Wausau Chemical Corporation	"Geo Blend PG"	Propylene glycol antifreeze fluid containing a denaturant and dye.	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Wausau Chemical Corporation	"Geo Blend IP"	Ethanol alcohol (ethyl alcohol) antifreeze fluid containing isopropyl alcohol, an acetate denaturant and a green dye.	Heat exchange transfer fluid for closed-loop geothermal heat exchange heating/cooling systems	None
Wyo-Ben, Inc.	"Grout-Well DF"	Same as above except grout uses granular.	Bentonite grout. Allowed for low capacity wells where neat cement grout is not required.	Mud weight at least 9.4 lbs/gal.

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Wyo-Ben, Inc.	"Grout-Well"	High solids bentonite grout (NSF Approved)	Bentonite grout. Allowed for low capacity wells where neat cement grout is not required.	Mud weight at least 9.4 lbs/gal.
Wyo-Ben, Inc.	"Naturpel"	Chipped sodium bentonite	Well, drillhole & pit abandonment.	None
Wyo-Ben, Inc.	"Plugz-It Max"	Coated granular bentonite (4 to 16 mesh)	Clay slurry ingredient; casing sealing material for percussion drilling & a lost circulation additive for rotary drilling	None
Wyo-Ben, Inc.	"Plugz-It"	Coated granular bentonite (8 to 40 mesh)	Clay slurry ingredient; casing sealing material for percussion drilling & a lost circulation additive for rotary drilling	None
Wyo-Ben, Inc.	"TD-16"	Coated granular bentonite grouting material	High solids bentonite grouting for use where neat cement grout is not required; And for a sealing and heat exchange material for closed-loop heat pump drillholes.	None
Wyo-Ben, Inc.	"Therm-Ex Grout Plus"	High solids geothermal bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None
Wyo-Ben, Inc.	"Therm-Ex Grout"	High solids geothermal bentonite grout	Grout, sealing or heat exchange material for closed-loop heat pump drillholes.	None
Wyo-Ben, Inc.	"ThinZ-It"	Polymeric drilling fluid additive and well development dispersant.	Drilling fluid additive -- to reduce viscosity; Or Well development dispersant -- to help remove clay and sediment from a well	As a drilling additive: May be used where air/foam drilling methods are allowed, Or In drilling mud, but only if drill mud slurry is replaced with neat cement grout at completion of well.
Wyo-Ben, Inc.	"Uni-Drill"	Liquid polymer drilling fluid additive	Drill fluid additive where air or air/foam drilling methods are used	None
Wyo-Ben, Inc.	"Wyo-Vis"	Liquid polymer viscosifying agent	Drilling fluid additive for both rotary mud and rotary air/foam drilling operations	None
Wyo-Ben, Inc.	"Air Foam"	Anionic Surfactant - alkyl ether sulfate	For rotary drilling to help remove drill cuttings, but only for bedrock	None
Wyo-Ben, Inc.	"Enviroplug Grout"	High solids (30%) sodium bentonite grout material	High solids bentonite (clay) grout for use where neat cement grout is not required	Mud weight of 9.9 lbs/gal. - check for settling
Wyo-Ben, Inc.	"Enviroplug No. 16"	100% coarsely-ground (16-mesh) (granular) sodium bentonite	Clay slurry ingredient; bentonite grout ingredient; lost circulation material for rotary mud drilling	None
Wyo-Ben, Inc.	"Enviroplug No. 8"	100% coarsely-ground (8-mesh) granular sodium bentonite	Clay slurry ingredient; lost circulation material for rotary-mud drilling	None
Wyo-Ben, Inc.	"Enviroplug"	100% chipped sodium bentonite, slow hydrating, chips (med. 1/4- 3/8" & coarse 3/8 - 3/4")	Well, drillhole & pit abandonment	See instruction sheet
Wyo-Ben, Inc.	"Extra High Yield"	Powdered drilling mud-type sodium bentonite (200-mesh) with 2-3 lbs/ton of	Rotary drilling mud & bentonite slurry ingredient	None

Wisconsin Department of Natural Resource Approved Drilling and Abandonment Products List Including Heat Exchange Borehole Products - Last Updated: June 11, 2013				
Manufacturer or Distributor	Product Name	Materials(s)	Uses	Special Conditions
Wyo-Ben, Inc.	"Hydrogel"	Powdered, drilling mud-type bentonite (200-mesh) with 1/4 - 1/3 lb./ton polyacrylate polymer	Rotary drilling mud clay; clay slurry ingredient	(See approval)
Wyo-Ben, Inc.	"Naturalgel"	Powdered (200-mesh) western sodium bentonite (montmorillonite)	Rotary drilling mud clay; clay slurry ingredient	None
Wyo-Ben, Inc.	"Dril-Sol"	Surfactant-based drilling fluid additive	For rotary drilling operations where air or air/foam drilling methods are allowed	None